Physiotherapeutic Evaluation of neurologic patient.

Principles of Examination of higher function -

Higher function -

1) Consciousness - Consciousness reflects the capacity of an ~~individua~~ individual's state of awareness & responsiveness to his own body, as well as external environment.
The level of conciousness will definately determine the type of ~~the~~ physical therapy treatment given to the patient.

ii) Behaviour - The patient may ~~may~~ be irritable, hostile, anxious, resistive shy, tense, fearful, negative, frank socially, friendly.
The therapist should observe the patient behaviour to plan effective treatment program.

iii) Memory - Memory is achived by various physiological & psycological process.
The patient is need to be assessed for his long term memory, short term memory & immediate memory.

The patient needs to be assised for his long term memory, short term memory & immitiate memory.

for testing long term momory one can obtain information regarding,

- date of birth
- age & year when he was off the school.
- date of marriage
- nursery rhymes.

for short term memory - Asking him about the recent meals when he come to hospital, ~~whith~~ with whome he come, name of doctor attending him.

for immidiate memory - he may be given name address phone numbers & asked to recall it after, 3 min, 15 min 30 min, 1 hr.

v) Intellectual capicity - Extimation of patient's intelligence can be made from his educational & professional level social development, ability to do simple calculation, communation skills.

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vi) Counting & calculation:- The patient ability to count & calculate may be evaluated by simple test.
- He may be asked to count forward & backward.
- count coins, simple addition & substruction.
- He may be asked questions like if he has three apples & five more is given to him, how many apples will he have

vii) Speech - The clarity of speech, tone articulation is need to be assessed.

viii) Reading & writing - The patient ability to read, his capicity to write ~~dictated~~ word & copy down certain texte material should be tested.

IIX Glasgow Coma scale
- A gold standred instrument used to document level of conciousness in acute brain injury.
- Total Glasgow coma scale score ranges from 3 to 15.
- 8 or less indicates severe brain injury & coma.
- The scale was developed by Jentt & group which is based upon the visual, moter & verbal responces

IX - Cranial Nerve Examination
X - Examination of reflexes
XI MMT

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Parkinsonism

Assessment

Observation- The overall behaviour of patient should be noted.

- The posture of patient should be observed in laying, supine, & standing.

- The skin condition ~~pere~~ presence of any superficial ~~condition~~ lesions should be checked.

- The type of tremors should be noted.

Examination

Higher functions like memory, intelligence speech orientation & behaviour should be checked.

• Motor Examination-

1) Tone- This should be checked by slow passive movement.

ii) Tightness- Testing of all two Jt muscles of upper limb & lower limb.

iii) ROM - The ROM of all Jt of upper & lower limb should be assessed with goniometer.

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- Test of Bradykinesia - for the upper limb the patient may be asked to take the hand to mouth or touch the opposite shoulder or touch the head.
  The time taken by the patient to compelete this task immidiately after the instruction is given is noted.

- Reflexes - The superficial & deep reflexes are checked.

- Coordination Assessment
  Coordination assessment can be done by verious test like fingure nose fingure test, alternate supination & pronation.

- Balance - The patient balance ~~is~~ should be checked in different postures eg- sidelaying sitting & standing.

Gait Assissment - The Gait Assessment include weather the patient is walking independently or with assisstance.

Unified Parkinson Disease Rating Scale

The UPDRS is a rating tool to follow the corse of parkinson's desease.
It is made up by 1) Beheaviour & Mood 2) ADL, 3) Motor sensations.
These are evaluated by interview.
A total of 199 points are possible, 199 represent worst (total disability), 0 - no disability.

• Management

- The physiotherapy treatment methods should be directed towards achieving main goal that is improving the functional performance in every day life.
- Various short few term goal has to be 1st achived.

1) Maintaining or improving the ROM at all Joint.
2) Preventing any contracture or deformity.
3) Encourage patient to live an active lifestyle.
4) Improve physical fitness of patient.
5) Prevent the influence of psychosocial factor like depression & over dependency on patient.

Integrated Approach of PT

I) Reduction of Rigidity -
- Rigidity has been found to reduce to some extent by, generalized relaxation technique.
- Technique of PNF can be used to reduce rigidity.

II) Maintaining the ~~flexi~~ flexibility of Musculoskeletal system.

Flexibility of musculoskeletal system can be maintained by encouraging the patient to live an active life.

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- Passive exersice by the therapist help in maintaining or increasing flaxibility. Passive Exersice to the patient should be given at least 2-3 times a day.

PNF technique of hold & ~~rel~~ relex or contract relase can be used to bring in lengthning of contracted muscles & thus increase in ROM of verious Jt.

The patient should be encourage to maintain Joint mobility ~~exersice~~ throughn active exersice.

Coordination Exersices-
frenkel's Exersics can be used.

Breathing or thoracic Expension Exersices

Diaphragmatic & segmental breathing exersices shoud be taught to improve the patient vital capicity.
Ex - Exersice like ballon blowing.

Functional Reeduction
The patient should be trained for verious activities like turning in the bed laying to sitting, sitting to standing walking straight.

Gait can be ~~user~~ trained by ~~the use of~~ making foot marker on floor.

Improvement in Psychological well-being

Once the patient is learns to live relatively active functional life he will feel much & more confident & independent & it will reduce the depression & over dependency of patients.

It is not fair to give false assurance to parkinson patient regarding his improvement because total recovery is not possible.

The best that could be done through physiotherapy is to maximize the patient functional independency.

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Cerebral Palsy

- Physical therapy is one of the most imp. treatment for CP that is begin soon after the diagnosis & continues throughout the life.

Goals of treatment -

- Teach the child to use his remaining Potential.
- Motivate the child for functional movement
- Careful assesment & recording of child should be done.

* Repetition & reinforcement are essential for learning & establishing of modified motor pattern.
* Prevent deformity, Decrease spasticity Improve Jt alignment.

- ~~Motivation~~ Involvement of the child as an active participant.
- Motivation of child should be kept high through out the treatment.
- All the porpousfull active movement should be facilitated.

PT techniques used in treatment of CP

1) Vojtas techinique - Vojta used the positions of reflex like crawling & rolling.

He proposed that placing the child in this positions & stimulation of the key point in the body would ~~eh~~ enhonance CNS development.

2) Bobath technique – This is the most commonly used therapy method of CP world wide

It aims to normalise muscle tone, inhibit primitive reflexes & stimulate normal movement.

3) Phelps technique – He used verious Exersice modalities like massage, Passive movement & motion using PNF pattern to get desired response.

4) PNf
5) Burnstorm Approach
6) Roods Approach.

Integrated Approach for CP

- Normalizing tone of the muscle – for cases with hypertonicity slow passive movement sustained strech, cryotherapy (15-20 mins) stimulation of antagonist movement & vibrations are used.

- Streaching & mobility – length of the muscle should be maintained not only through the streaching but also throgh verious functional activities.

Developing proper posture -
- Motor mile stones can be achived by promoting good posture
- It also helps in maintaining the proper alingment of head with respect to body.

Occupational therapy -
Speech therapy - helps to control mouth muscles.

Assessment

History - Review of complications of pregnency & delivery.
- birth wt
- Any neonatal & perinatal ~~difficulty~~ abnormality
- Developmental mile stones

~~Perinatal~~ Prenatal history - Age of mother
- Any drug taken during ~~delivery~~ pregnency
- Any trauma or stress
- Any Addiction - Alcoholism or smoking

Perinatal History - Place of delivery
History before during & after delivery
History of prolonged labor pain
Type of delivery

Postnatal History - Delayed birth cry
- cry of child at birth
- History of trauma to brain during 1st 2 years of life.
- History of neonate - meningitis
Jaundice
Hypoglycemia
Hydrocephalus

Observation
i Behaviour - weather child is alert irritable or fearful.
ii Communication skills of child
iii Involuntary movement
iv Deformities & contractures
v Postural faults
vi Gait disabilities

Traumatic head Injury

The clinical Rating system for various type of Head injury patient into different catagories, based on there signs & symptoms.

Glasgow Coma Scale

— A gold standard instrument used to document level of consciousness in ABI.

The GCS score ranges from 3 to 15

The scale was developed by Jennett & group based on visual motor & verbal responces — as follows:—

Eye Opening -	E
Spontaneous	4
To speech	3
To pain	2
Nil	1

Best Motor response	M
Obeys command	6
Localizes responces	5
With draws	4
Abnormal flexion	3
Extensor response	2
No response	1

Verbal response	V
Oriented ~~Conservation~~ conversation	5
Confused conversation	4
Inappropriate ~~sound~~ words	3
Inappropriate sounds	2
No response	1

Coma score is E + M + V = 3 to 15

Assessment

History - Information regarding the type of injury & its site is necessary.
- The duration of unconciousness.
- Presence of External bleeding.
- Some patient also have leak of CSF through nose.

Examination - stroke

Management -

- Management of Unconcious petients -

1 Respiratory care - The more number of day patient remain unconcious more intense & regular is the need of chest Physiotherapy.
Generally Physiotherapy is given in ~~ev~~ every 4-5 hrs

2 Preventing Contracture & Deformity -
- Passive movement ~~is~~ Repeated 8-12 time a day
- Gentle rhymatrive streaching.

3 Prevention & treatment of Pressure sores -
- The patient position should be changed from supine to side laying in every 2 hr.
- Patient should be lie on water bed or air bed which help in evenly distribute the wt throughout the body.

Management of concious patient -

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1) Improve alertness ~~& Aroused~~ through sensory stimulation -

- The therapist should encourage the patient's cooperation during the treatment.
- The therapist should provide visual auditory & proprioceptive stimulation to the patient ~~that will~~ which send facilitatory signals.

2) Prevention of spasticity -
- Passive movement repeated 8-12 time/day
- Gentle rhythmic streaching.
- Active assisted movement.

3) Maximize the patients functional capicity

The main Aim of this management is to improve the ROM, Improve the control on voolentry movement, Improve balance & teach verious safty measures.

By Neurodevelopmental Approaches

Common Assessment & Mangement
MND, spinal chord Injury & disease, PNI

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Assessment

Observation - Observation & Examination plays an important roll in rehab program.

It gives us a clear picture or idea of patient impairment & help us to plan treatment according to patient requirement.

1) The overall beheaviour of patient should be noted.

11) The posture of patient should be noted in laying sitting & supine

111) The skin condition, presence of any superfical lesion, odema or pressure sores should be checked.

Examination -

1 Testing of Higher mental functions - Conciousness
Behavior
Memory
Intelligence Speech

2 Motor Examination

1) Tone - This should be checked by slow passive movement.

11) Tightness - Testing of all two & jt muscles of upperlimb & lower limb.

iii) ROM - The range of motion of all Joint of upper & lower limb should be assessed by goniometer.

3) Reflexes Examination - Superficial & deep reflexes should be checked.

4) Cranial nerve Examination
i) Superficial sensation
ii) Deep sensation
iii) Cortical sensation

5) Voluntary control Assisment - MMT (0-5)

I) coordination Assisment - coordination assisment can be done by verious test like fingure nose fingure test, alternate supination & pronation test.

II) Balance - The patient balance should bee checked in different postures eg - side laying, sitting & standing.

III) Gait Assessment - The Gait Assessment include weather the patient is walking independently or with assesstance.

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Management

The primery goal of Physiotherapeutic treatment is -

1) Maintaning or improving Range of motion of all Joints.

2) Preventing any contrecture or deformity.

3) Preventing pressure sores in prolonged bed ridden patients.

4) Encourage the patient to live an active life style.

5) Improve physical fitness as well as eleminating negative psycological influnces like depression over dependency.

Intigrated Approaches of PT

1) Reduction of Rigidity & spasticity
- Rigidity has been found to reduce to some extant, by generalised relexation technique.
- technique of PNF can be use to reduce rigidity.

2) Maintaining the flexibility of Musculoskeletal System.

flexibility of musculoskeletal system can be maintained by encouraging patient to live active lifestyle

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Passive exersice by the therapiest help in maintaining or increasing flexibility. Passive Exersice to the patient should be given at least 2 - 3 times a day.

2) PNf technique of hold & relex & contract & relex can be used to bring in lengthning of contracted muscle & thus increase ROM of verious Joints.

3) Coordination Exersices -
Frankels Exersices & PNf are used to ↑se co-ordination

4) Breathing or thoracic expansion Exersices -
~~Diaphagra~~ Diaphragmatic & segmental breathing exersices should be ~~taut~~ taught to improve patient's vital capicity.
Ex - Exersice like balloon blowing.

5) functional Re eduction - (Parkinson)
The patient should be traind for verious activities like turning in bed, laying to sitting, sitting to standing, walking streight.

Gait can be ~~traint~~ trained by making foot marker on floor

6) Gait traning - Gait traning & coordination traning initialy with support & later on without support should be ~~arrie~~ carried out.

(spinal chord, hamiplagia, Paraplagia)

1) Prevention of pressure soars - Due to constant immobilization the patient can develop pressure soars at certain parts of body.
Certain Area are more susptable to develop pressure sors like sacrom, heel, lateral aspect of knee

To prevent pressure soars -
Patient position should be changed from supine to side laying in every two hours

Patient should be lie on water bed or air bed which help in evenly distribute the weight througout the body.

2) Prevent ignorence or unawareness of hamepdagic / paralytic side.

3) Care of bladder - The patiet is taugt self cleaning technique & intermittent catheterization.

4) Proper positioning of all Joints to prevent deformity.

5) Assistence in breathing by applying slight pressure over the chest during expiration & inspiration.

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Psycological Counsling-

Psycological counsling is very essentional to prevent the patient from going into state of depression & keep his moteration high.

It is not fair to give false assurance to patient regarding his improvement because total recovery is not possible.

The best that could be done through physcio therapy is to maximise the patient functional independency

The overall rehabilitation of patineut depends upon his motivation & determination & the dedication of therapist.

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Mild head injuries
Minimum brain damage

There are those type of head injury in which there is a minimal damage to the neuroanatomic structure with slight or no permanent ~~impairment~~ impairment.

These ~~is~~ are commonly encountered type of head injury.

Infact repeated minor injuries over a time have been responsible for gradual loss of neurological or coagnative functions with marked cerebral atrophy.

Due to damage in brain stem, reticular formation & some extent the cerebellum.

Symptoms - Head ache
dizziness
Increased fatiguability
decrease consentration power
Poor memory

Diagnosis - loss of concious level for less then 20min
Glasgow coma scale of more then 13
No abnormality on CT scan.

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Subacute & Combined Spinal chord degeneration -

Subacute combined degeneration of spinal chord is charachtized by degeneration of dorsal coloumn & lateral coloumns of SC due to demyelination.
It commonly present with sensory deficits paresthesia, weakness, ataxia & gait disturbance

Etiology - It is caused by Vit B12 deficiency
The cause of Vit B12 deficiency include following.
i) Nutritional deficiency
ii) Gastric Abnormalities
iii) Autoimmune
iv) Pernicious Anaemia
v) Small intistine desease that leads to malabsorption of Vit B12.
vi) Drug Abuse :- Metaformin
Nitrous Oxide

Symptoms - Patient present with weekness of legs, arm & trunk.
tingling & numbness.
loss of Vibrations & Proprioception
Spastic paralysis
loss of tendon reflex in extermities
Megaloblastic Anaemia due to Vit B12 deficiency.

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- Diagnosis- Serum vitamin B12 - schilling test
  CBC - Megaloblastic Anaemia | low serum Vit B12
  CT MRI dorsal & lateral colour Degenerative changes in
- Management
  1) - Vitamin B12 supplementation by intramuscular, deep subcutaneous oral, or sublingual route
  ii) Most commonly used prepration are cyanocobalamin & hydroxocobalmin.
  iii) injection of Vit B12

Patient Present with:-

→ i Loss of Movement
ii Loss of sensation
iii loss of bladder & bowel control
iv Abnormal reflex activity & spasm
v Changes in sexual function
vi Difficulty & breathing & coughing
vii Megaloblastic Anaemia due to Vit B12 deficiency.

Neurodevelopmental Approaches

- These approaches was developed by Dr Karl Bobath & his wife Berta Bobath.

- These approaches ~~is~~ are developed for more effective treatment of children with Cerebral palsy.

- The problem in cerebral palsy occours due to result of abnormal postural reflexes & tone which interfere with the development of ~~higher level reaction~~ Normal reflex pattern & equilibrium responses.

- As this technique was getting developed it was found that there is a need of analysis of movement before implanting the treatment process. Analysis of movement was based on observation & comperasion with normal developmental pattern.

- Abnormal movement pattern were described as premature reflex responces, which lost there higher influences.

- A process of inhibiting ~~normal~~ Abnormal responces ~~was~~ ~~integrated~~ with facilitation technique to produce normal ~~responces~~ control.

Principle of NDA

2 Sensory Integration -
It has been proved that sensory system has fascilitatory & inhibitatory influence on motor system.

Motor system dosent function independently but needs input from verious sensory system.

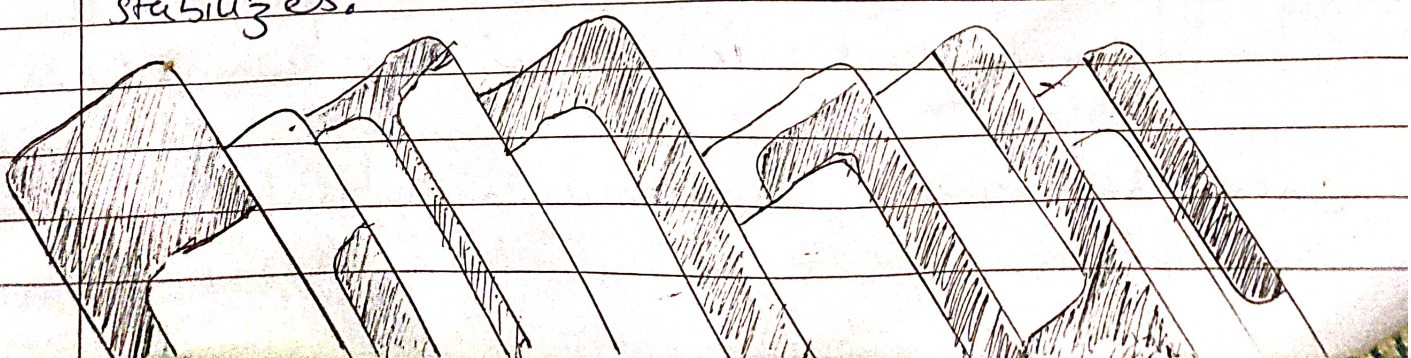
Sensory integration ~~system~~ is the term used to ~~integrate~~ ~~integrate~~ indicate therapeutic process, which combine verious forms of sensory inputs like cutneous sensation proprioceptors & visual etc to get desired motor response.

3 PNF — PNF is an approach to therapeutic exersices which involve functionally based diagonal pattern of movemet, with technique of neuromuscular fascilation to evoke motor responces.

4) Motor realearning Program (MRP).

- According to this concept development of a functional task can be achived best when ~~the task itself is practiced.~~ It is performed by patient themselves.

- MRP is very effective in patient with stroke & can be started as soon as the general medical condition of patient stabilizes.



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Motor relearning program is practiced in 4 steps.

Step 1 - It involves observation of patient's performence of functional task.

Every functional task has verious components that is necessory ~~towards~~ to achive that task.

Thus when the therapist observes the performence of patient, he is in position to list out those components that are missing from ~~patient~~ patient's performence.

Then he needs to analize the reason of missing components.

Step 2 - It involves practice of missing components using verious visuals, verbal & mannual feed back under the guidence of therapist.

Step-3 - Involves practice of ~~whole~~ whole task using the same feedback.

Step 4 Consist of tranning during which patient should maintain consistency in practice. The patient ~~is~~ need to practice the learned task in home or when he is alone.

Once the missing component is actuated immediately the patient should practice the whole activity.

Biofeedback

The biofeed back is used in rehabilitation of neurological patient is EMG biofeed back.

- It is done with the help of surface EMG electrodes which is placed on the muscle or muscle group that needs to be actuated or inhibeted.

- with the introduction of computerised machine, the display wave represent the average responce of all motor unit, which is recorded by surface electrode.

The biofeed back machine can be used to strengthen week muscle ~~week ness~~ as well as relex hypertonic muscle.

for strengthning process the patient is instructed to concentrate ~~the~~ on increasing the size of displayedwave, wharies for relexing of spastic muscle the patient is instructed to try to reduce the size of wave.

EMG biofeed is sucessfully used in rehabilitating cases of LMN type like neuropathy & peripheral nerve injury & UMN type like stroke.

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Burnstrome technique -

This technique was developed by burnstrome produce motion by provoking primetive movement patterns.

This technique is quit extensively used to develop tone in flaccid stage of hemiplagia. ~~& in pure pre pyramidal lesion.~~

Roods technique -

This was mainly done to produce porposeful muscular contractions by stimulating the skin, by stroking, broshing, iceng ~~tea ching~~ heating.

The stimulus given through skin has fasclitatory & inhibitatory responce.

Bobath technique - This is based on normal movement of neuro developmental approach.

The main aim is to prevent abnormal ~~normal~~ movement & fascilitate normal movement.

Vojtas technique - Vojta used position of reflex like crawling & rolling.

He proposed that placing the child in these positions & stimulation of key points in the body would enhanance CNS development.

Ataxia

Certain principles need to be applied when treating cases of Ataxia –

i) Intensive consentration of patient
ii) Active participation of patient shood be encourged
iii) frequent rest periods needs to be given.
iv) Patient should be alwas relaxed & comfertable & in supported position.
v) Repetition of task is very important for recovery.

Head & trunk control

Patient with poor head control can be treated in prone with one or two pillow under the chest of patient.
facilitation of neck extensors & shoulder ~~gardel~~ gurdle can be achived by using techniques like stroking & vibration directly on the muscle bulk.

Sitting Balance
Once the patient achive good head & trunk control, The patient should be made to sit on a stable surface like stool in a unsopported position & the therapiest give gentle pushes in all direction.
Alternatively the patient may be asked to sit on unstable surface like a vestibular ball without holding any support.

Standing Activities-

Sitting to standing can be practiced by making the patient to sit on chair, such the the feet are in proper contact with the ground.

The patient is advised to lean slightly so ~~seat~~ that the centre of gravity is brought b/w the feet,

The therapist should stabilize the knee & support the pelvis & encourage the patient to assume standing posture

Repetition of this task is essentional till the patient masters in activity.

Gait traning-

Gait troning may be initially given in parallel bar with foot marks.

foot marks are essentional to reduce the tendency of patient to walk with circle base of support.

Some type of frenkel Exersices-

I) flex & Extend one leg, by the heel sliding down in straight line on the table.

II) flex & Extend the knee with heel off the table

III) Place the foot forward & backwand on stright line.

IV) Walk b/w two (II) lines

V) Walk by placing the feet on marked point